

What is claimed is:

- 1 1. A nucleic acid molecule encoding a fusion protein comprising:
 - 2 (a) a signal sequence;
 - 3 (b) an immunoglobulin Fc region; and
 - 4 (c) a target protein sequence comprising interferon-alpha,
 - 5 wherein the signal sequence, the immunoglobulin Fc region and the target protein
 - 6 sequence are encoded serially in a 5' to 3' direction.
- 1 2. The nucleic acid of claim 1 wherein the immunoglobulin Fc region
- 2 comprises an immunoglobulin hinge region.
- 1 3. The nucleic acid of claim 1 wherein the immunoglobulin Fc region
- 2 comprises an immunoglobulin hinge region and an immunoglobulin heavy chain constant
- 3 region domain.
- 1 4. The nucleic acid of claim 1 wherein the immunoglobulin Fc region
- 2 comprises an immunoglobulin hinge region and an immunoglobulin CH3 domain.
- 1 5. The nucleic acid of claim 1, wherein the immunoglobulin Fc region
- 2 comprises a hinge region, a CH2 domain and a CH3 domain.
- 1 6. The nucleic acid of claim 5 wherein the immunoglobulin Fc region
- 2 comprises a portion of an immunoglobulin gamma sequence.
- 1 7. The nucleic acid of claim 6 wherein the immunoglobulin gamma is human
- 2 immunoglobulin gamma1.
- 1 8. A replicable expression vector for transfecting a mammalian cell, the
- 2 vector comprising the nucleic acid of claim 1.

3 (b) culturing the mammalian cell to produce the fusion protein.

1 21. The method of claim 20 comprising the additional step of collecting the
2 fusion protein.

1 22. The method of claim 20 comprising the additional step of purifying the
2 fusion protein.

1 23. The method of claim 20 comprising the additional step of cleaving with a
2 proteolytic enzyme the immunoglobulin Fc region from the target protein at a proteolytic
3 cleavage site disposed between the immunoglobulin Fc region and the target protein.

1 24. A method of treating a condition alleviated by the administration of
2 interferon-alpha comprising the step of administering the nucleic acid of claim 1 to a
3 mammal having the condition.

1 25. A method of treating a condition alleviated by the administration of
2 interferon-alpha comprising the step of administering the vector of claim 8 to a mammal
3 having the condition.

1 26. A method of treating a condition alleviated by the administration of
2 interferon-alpha comprising the step of administering the fusion protein of claim 11 to a
3 mammal having the condition.

1 27. A method of treating a condition alleviated by the administration of
2 interferon-alpha comprising the step of administering protein of claim 18 to a mammal
3 having the condition.

1 28. The method of claim 26 wherein the condition is a liver disorder.

1 29. The method of claim 28 wherein the liver disorder is hepatitis.

- 1 9. The replicable expression vector of claim 8 wherein the vector is a viral
2 vector.
- 1 10. A mammalian cell harboring the nucleic acid of claim 1.
- 1 11. A fusion protein comprising in an amino terminal to carboxy terminal
2 direction an immunoglobulin Fc region and a target protein comprising interferon-alpha.
- 1 12. The fusion protein of claim 11 wherein the interferon-alpha comprises an
2 amino acid sequence set forth in SEQ. ID. NO.: 2, 7 or 8-21 or a species or allelic variant
3 thereof.
- 1 13. The fusion protein of claim 11 wherein the target protein comprises at
2 least two interferon-alpha molecules linked by a polypeptide linker.
- 1 14. The fusion protein of claim 13 further comprising a polypeptide linker
2 linking the immunoglobulin Fc region to the target protein.
- 1 15. The fusion protein of claim 11 wherein the immunoglobulin Fc region
2 comprises an immunoglobulin hinge region and an immunoglobulin heavy chain constant
3 region domain.
- 1 16. The fusion protein of claim 15 wherein the heavy chain constant region
2 domain comprises a CH3 domain.
- 1 17. The fusion protein of claim 11 wherein the immunoglobulin Fc region
2 comprises a hinge region, a CH2 domain and a CH3 domain.
- 1 18. A multimeric protein comprising at least two fusion proteins of claim 11
2 linked via a covalent bond.
- 1 19. The protein of claim 18 wherein the covalent bond is a disulfide bond.
- 1 20. A method of producing a fusion protein comprising the steps of:
2 (a) providing the mammalian cell of claim 10; and